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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,785	11/13/2001	Kaveh Momeni	70031	3691

7590 09/09/2003

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Scarborough Station
Scarborough, NY 10510-0827

EXAMINER

MCHENRY, KEVIN L

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 09/09/2003

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/763,785

Applicant(s)

MOMENI ET AL.

Examiner

Kevin L McHenry

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30-34, 38-40 and 42 is/are allowed.
- 6) ☒ Claim(s) 21-24, 26-29, 35, 36, 41 and 43 is/are rejected.
- 7) ☒ Claim(s) 25 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 22, 26, and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 22 recites the limitation "the bulk" in line 2 of claim 22. There is insufficient antecedent basis for this limitation in the claim. For examination purposes the examiner interpreted this language to mean "a bulk".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 35, 36, and 41 are rejected under 35 U.S.C. 102(a) as being anticipated by Tsurushima (U.S.P. 5,741,410).

Tsurushima teaches an apparatus for placing a plurality of shaped parts of solder material onto a bond pad arrangement of a substrate with a plurality of bond pads. The apparatus includes a template with a selecting device. The template includes a housing with a selecting device so that the template has a housing with an aperture screen composed of a multitude of template apertures for accommodating shaped solder. The

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template apparatus is composed of a transparent material so that the rear wall opposite the apertures is transparent so that a plurality of apertures can be exposed to laser irradiation. The diameter of the apertures is smaller than the smallest diameter of the shaped solder parts (see U.S.P. 5,741,410; particularly Figures 1a and 4; column 3, lines 54-67; column 4, lines 1-5, 25-27, 42-49, 63-67; column 5, lines 1-20, 57-60; column 6, lines 4-7; column 7, lines 61-64).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 21, 23, 24, 28, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsurushima (U.S.P. 5,741,410) in view of Tan (U.S.P. 4,278,867).

Tsurushima teaches an apparatus for placing a plurality of shaped parts of solder material onto a bond pad arrangement of a substrate with a plurality of bond pads. The apparatus includes a template composed of a multitude of template apertures for accommodating shaped solder opposite the substrate so that the solder parts are associated with individual bond pads. The apertures are filled by selecting solder via vacuum pressure from a quantity of solder parts outside of the template device. The template apparatus is composed of a transparent material so that the rear wall opposite the apertures is transparent. Laser energy is applied to the shaped solder parts in the

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apertures by a laser device arranged at the rear of the template so that the laser energy is applied to the solder through the template. Tsurushima teaches that a scanning or inspecting device is used to detect solder parts in the template apertures prior to the application of laser energy (see U.S.P. 5,741,410; particularly Figures 1a and 4; column 3, lines 54-67; column 4, lines 1-5, 25-27, 42-49, 63-67; column 5, lines 1-20, 57-60; column 6, lines 4-7; column 7, lines 61-64).

Tsurushima does not teach a swivel mirror for applying the laser energy.

Tan teaches a process of heating electronic components and solder by laser energy. Tan teaches that the laser energy can be distributed by using a swiveling mirror system that allows rapid scanning of the laser beam over the parts to be assembled. The scanning system can also be controlled by a computer (see U.S.P. 4,278,867; particularly Figure 4; column 4, lines 65-68; column 5, lines 1-3; column 6, lines 29-68; column 7, lines 1-14).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the apparatus of Tsurushima by the teachings of Tan. One would have been motivated to do so in order to provide a method of scanning a laser beam rapidly, as taught by Tan. One of ordinary skill would also have been motivated to use a computerized swivel system, as taught by Tan, in order to provide a scanning system that was more efficient and precisely controlled.

The examiner notes the intended use in claim 21 of using the method for remelting the solder parts on the bond pads. However, the examiner notes that no such remelting step has been recited by the applicant.

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8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsurushima (U.S.P. 5,741,410) in view of Tan (U.S.P. 4,278,867) as applied to claims 21, 23, 24, 28, and 43 above, and further in view of Azdasht et al. (U.S.P. 6,059,176).

The former references teach the process described above in section 7. However, these references do not teach the application of a pressure above atmospheric on the solder parts.

Azdasht et al. teach a process for the application of solder parts to bond pads in which the solder parts are pressed against the bond pads during melting of the solder. Azdasht et al. teach that this step permits the thermocompression bonding of gold (see U.S.P. 6,059,176; particularly column 3, lines 20-24).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process above by the teachings of Azdasht et al. One would have been motivated to do so in order to permit the thermocompression bonding of gold, as taught by Azdasht et al.

Allowable Subject Matter

9. Claims 30-34, 38-40, and 42 are allowed.

10. Claims 25 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 22, 26, and 27 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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12. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest a method or apparatus for placing shaped solder on a bond pad arrangement of a substrate that includes a plurality of bond pads, using a template device that has a plurality of apertures for receiving solder and is placed opposite the substrate and bond pad arrangement so that the solder is aligned with individual bond pads, and then subsequently re-melting the solder on the bond pads with a laser from the rear side of the solder placement template, wherein filling of the template apertures is done with a paddle-wheel device that is guiding in parallel to the surface of the aperture screen and is rotated on an axis.

Nor does the prior art of record teach or suggest an apparatus for placing shaped solder on a bond pad arrangement of a substrate by using a template device with a container for a quantity of shaped solder, with a wall of the container forming an aperture screen that acts as a selecting device for singling out shaped solder from a movable fill chamber so that the solder can be exposed to laser energy from the rear of the template device, wherein the aperture screen or the sidewall of the filling chamber are comprised of at least three layers with a flexible compression layer sandwiched between two wear-resistant layers.

Nor does the prior art of record teach or suggest an apparatus for placing shaped solder on a bond pad arrangement of a substrate by using a template device with a selecting device, a housing that forms an aperture screen that accepts shaped solder, and a transparent rear wall opposite the aperture screen, wherein the diameter of the apertures in the aperture screen is larger than the largest diameter of the shaped solder

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and the distance between the screen and the rear wall of the template is less than the smallest diameter of the shaped solder parts.

Nor does the prior art of record teach or suggest such a process in which laser energy is applied to the solder parts by the optical scanning device.

Nor does the prior art of record teach or suggest a process or apparatus for placing a plurality of solder parts on a bond pad arrangement and subsequent remelting the solder parts in which a template device has a container for holding a quantity of shaped solder parts with a transparent rear wall.

Response to Arguments

13. Applicant's arguments with respect to claims 21-43 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L McHenry whose telephone number is (703) 305-9626. The examiner can normally be reached on M-F.

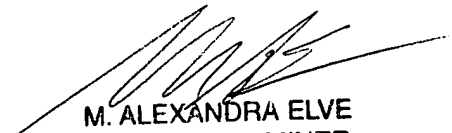
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Dunn can be reached on (703) 308-3318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1234.



Kevin McHenry



M. ALEXANDRA ELVE
PRIMARY EXAMINER